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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,892	07/28/2003	Masayuki Shinohara	SUG-168-USAP	3807

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EXAMINER	
MALDONADO, JULIO J	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,892	SHINOHARA ET AL.	
	Examiner	Art Unit	
	Julio J. Maldonado	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) *1-24,28,29,31,33,35,37 and 39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-27 and 30* is/are rejected.

7)☒ Claim(s) *32,34,36 and 38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20030728*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 25-27, 30, 32, 34, 36 and 38 in the reply filed on 04/22/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

2. Claims 27 and 32 are objected to because of the following informalities: claims 27 and 32 recite, "...epitaxy process in the residual portion...". However, there is no description of a residual portion earlier in the claims. Appropriate correction is required.

3. Claim 30 is objected to because of the following informalities: In claim 30, where applicants recite, "...within a range from 5 m to 200 m...", change to --within a range from 5 nm to 200 nm--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 25 and are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicants' Admitted Prior Art (hereinafter the prior art) in view of Solomon et al. (U.S. 6,569,765 B1).

In reference to claims 25 and 27, the prior art teaches a light emitting device including a light emitting layer portion; a current spreading layer portion formed on the light emitting layer portion; and an electrode between said light emitting layer portion and said current spreading layer portion, wherein the current spreading layer portion is formed by an N-type semiconductor layer, wherein said layers are made of group III-V semiconductors and wherein said light emitting layer portion and said current spreading layer portion are formed by metal organic vapor phase epitaxy (Instant page 1, [0002] – page 5, [0008]).

The prior art fails to teach wherein the current spreading layer portion is formed by a hydride vapor phase epitaxy process different from the metal organic vapor phase epitaxy process. However, Solomon et al. teach group III-V semiconductor heterostructures including a first layer formed by metal organic chemical vapor deposition and a second layer formed by hydride vapor phase epitaxy, which is different from the metal organic chemical vapor deposition (column 2, line 31 – column 3, line 37). Furthermore, Boutros et al. to U.S. 2005/0110041 A1 teach wherein metal organic vapor phase epitaxy processes are often known as metal organic chemical vapor deposition processes (Boutros et al., [0005]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the prior art and Solomon et al., because according to Solomon et al., HVPE processes may include reactants that may affect the surface of a semiconductor wafer, and also, changing from MOCVD to HVPE results in a faster, cost effective process (column 3, lines 26 – 36).

In reference to claim 26, the combined teachings of the prior art and Solomon et al. substantially teach all aspects of the invention but fail to disclose wherein the portion of the current spreading layer formed by a hydride vapor phase epitaxy process has a C concentration of $7x10^{17}/cm^3$ or lower. However, the selection of the claimed dopant concentration is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species to obtain a desired device conductivity specifications. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a current spreading layer having the above mentioned carbon concentration to arrive at the claimed invention.

In reference to claim 30, the combined teachings of the prior art and Solomon et al. substantially teach all aspects of the invention but fail to disclose wherein the thickness of the current spreading layer is adjusted within a range from 5 nm to 200 nm. Notwithstanding, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re

Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Allowable Subject Matter

6. Claim 32 and claims depending from claim 32, that is claims 34, 36 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the current spreading layer having a higher dopant concentration in the electrode side portion than in a residual portion of the current spreading layer.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax number for this group is 703-872-9306 for before final submissions, 703-872-9306 for after final submissions and the customer service number for group 2800 is (703) 306-3329. Updates can be found at http://www.uspto.gov/web/info/2800.htm.

Julio J. Maldonado
Patent Examiner
Art Unit 2823

Julio J. Maldonado
July 11, 2005

George Fourson
Primary Examiner